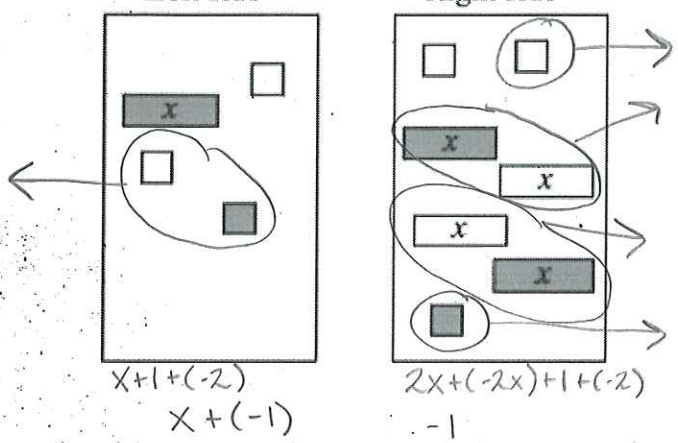
Name: Key Per: Date:

Pre Algebra Ch. 6 Group Review

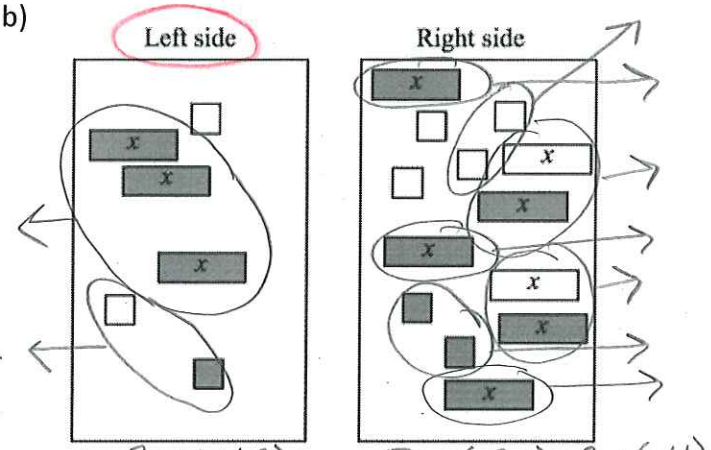
1) Write the expression shown on both sides of each comparison mat. Simplify each side as much as possible. State which side is greater and how you know. If it is impossible to tell which side is greater, explain why.

a)



Ans: Can't be determined (don't know the value of x)

b)



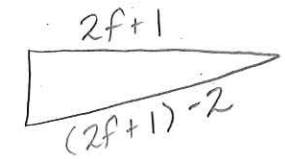
Ans: _____ >

2) To solve the following problem, use the 5-D Process. Define a variable and write an expression for each column of your table.

A triangle has three sides. The second side is one more than double the first side and the third side is two less than the second side. The perimeter is 110 cm. How long is each side?

Describe/Draw: Triangle, perimeter = 110cm

1st side = f, 2nd side = 2f+1, 3rd side = (2f+1)-2



$f + 2f + 1 + (2f+1) - 2 = 110$

$\frac{5f}{5} = \frac{110}{5}$

$f = 22$

1st = 22cm

2nd = 2(22)+1 = 45cm

3rd = 2(22)+1-2 = 43cm

Ans: 1st = 22cm, 2nd = 45cm, 3rd = 43cm

3) A rectangle has a length of 12 units and an unknown width "w." Write an expression for each:

a) the perimeter of the rectangle

Ans: 2(w+12) or 2w+24

b) the area of the rectangle

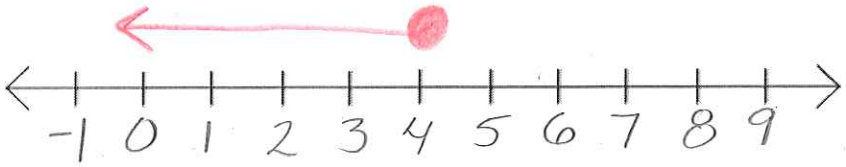
Ans: 12w

4) Solve and graph each inequality:

a) $a - 3 \leq 1$

$+3 \quad +3$

$a \leq 4$



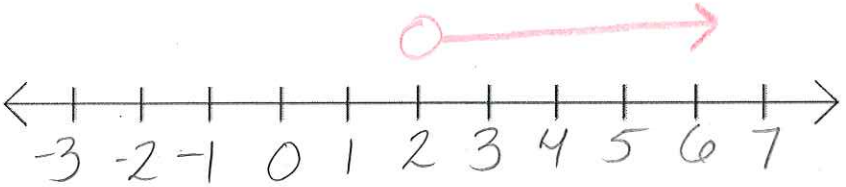
Inequality: $a \leq 4$

b) $2m + 1 > 5$

$-1 \quad -1$

$\frac{2m}{2} > \frac{4}{2}$

$m > 2$



Inequality: $m > 2$

c) $3x - 1 \geq -x + 3$

$+x \quad +x$

$4x - 1 \geq 3$

$+1 \quad +1$

$\frac{4x}{4} \geq \frac{4}{4}$

$x \geq 1$

Inequality: $x \geq 1$

5) Two more than the product of five and a number is less than or equal to 32. Write the inequality and solve it.

$5x + 2 \leq 32$

$-2 \quad -2$

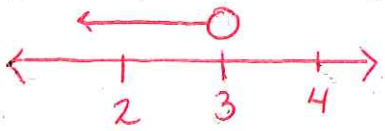
$\frac{5x}{5} \leq \frac{30}{5}$

$x \leq 6$

Inequality: $x \leq 6$

6) What is a "boundary point" and why would you need to know about it? Use a number line to help explain.

A boundary point separates the number line into two regions. The boundary point is included in the solution for situations that involve ≤ or ≥ and excluded from situations that involve < or >. For example in the graph x < 3 the boundary point can be seen on the graph (number line) below. The solution is all numbers more than three or those shown from the boundary point of 3 (but not including three) and higher.



7) Using any variable you wish to represent the unknown number, write each of the following as an algebraic expression.

a) The product of a number and 6

Ans: 6c

b) The sum of a number and 12

Ans: a + 12

c) The difference of a number and 8

Ans: g − 8

d) The quotient of a number and 15

Ans: $\frac{b}{15}$ or $b \div 15$

8) Amanda had \$20 when she went into the shopping center. She purchased a snack to eat for \$*y* and then bought two items at a clothing store, each of which cost \$*x*. Which expression represents the amount of money she has left after these purchases? Circle any that work.

a) y + 2x – 20 b) 20 – 2y – x c) 20 – 2x – y d) 2 · (20 – y – x)

9) Solve each equation.

a) $14 - x = 42$

$-14 \quad -14$

$\frac{-x}{-1} = \frac{28}{-1}$

Ans: x = −28

b) $y + 4 = -42$

$-4 \quad -4$

$y = -46$

Ans: y = −46

c) $\frac{56z}{56} = \frac{14}{56}$ $\frac{14 \div 14}{56 \div 14} = \frac{1}{4}$

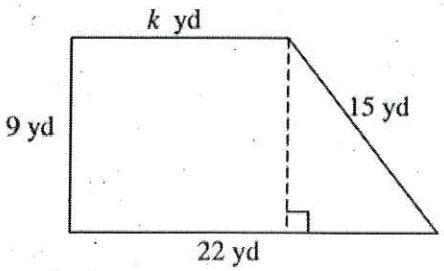
Ans: $\frac{1}{4}$ or .25

d) $\frac{m}{6} = 3 \cdot 6$

$m = 18$

Ans: 18

10) The figure has a perimeter of 56 yards. Write an equation using the information given in the picture, and the information given about the perimeter. How long is *k*? Then find the total area of the figure.



$K + 15 + 22 + 9 = 56$

$K + 46 = 56$

$-46 \quad -46$

$K = 10$

Trapezoid:

$\frac{(b_1 + b_2)}{2} \cdot h = \frac{22 + 10}{2} \cdot 9$

$\frac{32}{2} \cdot 9 = 16 \cdot 9 =$ 144

OR

Rectangle: $b \cdot h$

$10 \cdot 9 = 90$

Triangle: $\frac{1}{2} b \cdot h$

$\frac{1}{2}(12)(9)$

$90 + 54 =$ 144

k = 10 Area = 144 yd²

11) Simplify each of the following expressions.

a) $6n - 4 - n + 3 - 2n$

Ans: $3n - 1$

b) $6n - 4 - 3(2 - 2n)$

$6n - 4 - 6 + 6n$

Ans: $12n - 10$

c) $5(2n + 7) - 8(11 - 4n)$

$10n + 35 - 88 + 32n$

Ans: $42n - 53$

d) $\frac{6n-18-3(2-4n)}{3n+3(2-n)} = \frac{6n-18-6+12n}{3n+6-3n}$

$\frac{18n-24}{6} = \frac{18n}{6} + \frac{-24}{6} =$

Ans: $3n - 4$

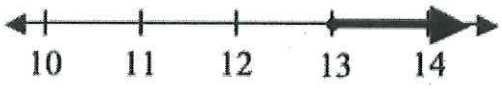
12) Write an inequality to represent each of the following graphs.

a.

b.

c.

d.



a) $x \leq 3$ b) $x < 9$ c) $x < -5$ d) $x \geq 13$

13) Veronica thinks there is no difference between each pair of equations below. Consider each pair and decide for yourself if the equations are equivalent or not. Explain why you believe your answer is correct.

a) 3x = 9 and 12x = 36 Yes or No

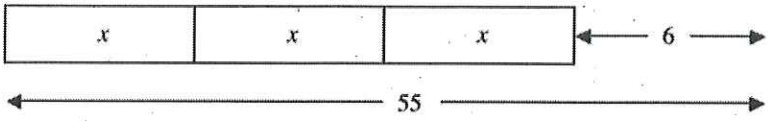
b) 1x = 17.1 and x = 17.1 Yes or No

c) 5x – 1 = 9 and 5x = 10 Yes or No

d) 6x + 5 = 6(x – 1) Yes or No

Explain: a) both $x=3$
b) coefficient of one for x, but not always written
c) add one to each side
d) No, right side would be $6x-6$

14) What value of x is a solution to the equation $3x + 6 = 55$ represented below?



$55 = 3x+6$
$-6 \quad -6$
$\frac{49}{3} = \frac{3x}{3}$
$x = 16\frac{1}{3}$ or $16.\overline{3}$

Ans: $16\frac{1}{3}$ or $16.\overline{3}$

15) Solve each of the following equations.

a) $5g - 7 = -52$
$+7 \quad +7$
$\frac{5g}{5} = \frac{-45}{5}$

Ans: -9

b) $3h + 8 = 5$
$-8 \quad -8$
$\frac{3h}{3} = \frac{-3}{3}$

Ans: -1

c) $2(x-3) = 2x-6$
$2x-6 = 2x-6$
$-2x \quad -2x$
$-6 = -6$
same thing

Ans: ∞ many solutions

d) $3x - 4(5-x) = 7x+2$
$3x-20+4x = 7x+2$
$7x-20 = 7x+2$
$-7x \quad -7x$
$-20 \neq 2$

Ans: No Solution No variable and a false statement

e) $3 - 2(x-4) + 5x = 3(x-2) + 4x$
$3-2x+8+5x = 3x-6+4x$
$11+3x = 7x-6$
$-3x \quad -3x$
$11 = 4x-6$
$+6 \quad +6$
$\frac{17}{4} = \frac{4x}{4}$

Ans: $4\frac{1}{4}$ or 4.25 $x = 4\frac{1}{4}$ or 4.25

16) While working together, Ava and Mackenzie came across this problem: $3(x-2)=12$. Ava started by distributing the three to remove the parentheses while Mackenzie started by dividing both sides by three. Who is correct? Justify your answer completely by solving the equation both ways.

Ava: $3(x-2)=12$

$3x-6=12$

$+6 \quad +6$

$\frac{3x}{3}=\frac{18}{3}$

$x=6$

Mackenzie: $\frac{3(x-2)}{3}=\frac{12}{3}$

$x-2=4$

$+2 \quad +2$

$x=6$

Ans: Both

17) I am thinking of a number. If you add 3 to the number and then multiply the sum by four, you end up with 48. What is my number? Write an equation and solve it. Check your solution.

$4(x+3)=48$

$4x+12=48$

$-12 \quad -12$

$\frac{4x}{4}=\frac{36}{4}$ $\quad x=9$

Ans: 9

18) Simplify each of the following:

a) $-6\frac{3}{7}\cdot\frac{2}{3}$

$-\frac{45}{7}\cdot\frac{2}{3_1}=-\frac{30}{7}$

Ans: $-4\frac{2}{7}$

b) $4\frac{1}{4}\div -6\frac{3}{5}$

$\frac{17}{4}\div\frac{-33}{5}$

$\frac{17}{4}\cdot-\frac{5}{33}=\frac{-85}{132}$

Ans: $\frac{-85}{132}$

c) $5\frac{3}{4}-7\frac{1}{3}$ improper

$\frac{233}{43}+\frac{-22}{3}\cdot 4$ common denominator

$\frac{69}{12}+\frac{-88}{12}=\frac{-19}{12}$

Ans: $-1\frac{7}{12}$

d) $2\frac{2}{9}+6\frac{5}{6}$

$2\frac{4}{18}+6\frac{15}{18}$

$8\frac{19}{18}$

Ans: $9\frac{1}{18}$

19) As an archer, Tess has a shooting percentage of 85%. That means she hits the bulls eye 85% of the shots she attempts. If she attempts 410 shots this season, on about how many shots will she hit the bulls eye?

$410(.85) =$

Ans: 348.5

20) Solve each of the following percent problems.

a) 28 is what percent of 96?

$\frac{28}{96} = \frac{x}{100}$

Ans: $29.1\overline{6}$

b) 82 is 120% of what number?

$\frac{82}{x} = \frac{120}{100}$

Ans: $68.\overline{3}$

21) At Spiney Torture Middle School, 35% of the classrooms are for sixth graders. If there are 49 sixth grade classes:

a) How many classrooms are there total?

$\frac{49}{x} = \frac{35}{100}$

Ans: 140

b) How many 7th and 8th grade classrooms are there?

$140 - 49$

Ans: 91

22) An outcome grid for a game in which players flip a coin and roll a die is shown. Use the grid to find the probability that you will get:

a) P (heads and 6) = 1/12

b) P (heads and odd) = 1/4

c) P (tails and less than 6) = 5/12

		Die					
		1	2	3	4	5	6
Coin	H	H1	H2	H3	H4	H5	H6
	T	T1	T2	T3	T4	T5	T6